WHAT IS CLAIMED IS:

1. A high-pressure generating device comprising a housing with an intake port and an outlet port, a pressure chamber formed in said housing and having a plurality of chamber sections connected to said intake and outlet ports through check valves and fluid passages, a piston disposed reciprocally in said pressure chamber, and an actuator for moving reciprocally said piston to allow fluid to be introduced from said intake port into said pressure chamber and discharged from said pressure chamber through said outlet port.

2. A high-pressure generating device as claimed in claim 1, wherein said actuator includes an operating pressure source for exerting operating fluid on said piston through a directional control valve to move said piston reciprocally.

3. A high-pressure generating device as claimed in claim 1, wherein said actuator includes mechanical driving means and an electric motor.

4. A high-pressure generating device comprising a cylindrical housing with an intake port, an outlet port, a pressure chamber, a first protrusion extending inside said pressure chamber and having a first fluid passage connecting said intake port to said pressure chamber, a second protrusion extending inside said pressure chamber and having a third fluid passage connecting said outlet port to said pressure chamber, said second protrusion being provided at its innermost end with a partition member, a cylindrical

piston disposed reciprocally in said pressure chamber and having a first chamber section, a second chamber section, a third chamber section and a partition wall for partitioning said first and second chamber sections, said partition wall having a second fluid passage, said first chamber section being connected to said intake port through said second fluid passage, said third chamber section being connected to said outlet port through a fluid passage in said second protrusion, said first and second chamber sections being connected to each other through a second fluid passage in said partition wall, a first check valve mounted in said first fluid passage for allowing fluid to flow from said intake port to said first chamber section, a second check valve mounted in said second fluid passage for allowing fluid to flow from said first chamber section to said second chamber section, a third check valve mounted in said third fluid passage for allowing fluid to flow from said second chamber section to said third chamber section, and an actuator for moving reciprocally said piston to allow fluid to be introduced from said intake port into said pressure chamber and discharged from said pressure chamber through said outlet port.

5. A high-pressure generating device as claimed in claim 4, wherein said actuator includes an operating pressure source for exerting operating fluid on said piston through a directional control valve to move said piston reciprocally.

6. A high-pressure generating device as claimed in claim 4, wherein said actuator includes driving means, a universal joint, and a rotation-to-linear motion converter.

7. A high-pressure generating device as claimed in claim 6, wherein said driving means is an electric motor.

8. A high-pressure generating device as claimed in claim 6, wherein said actuator includes driving means and a cam.

9. A high-pressure generating device as claimed in claim 8, wherein said driving means is an electric motor.

10. A high-pressure generating device as claimed in claim 4, wherein said first chamber section is larger in volume than said second chamber section.

11. A high-pressure generating device as claimed in claim 4, wherein said first check valve includes a ball and a spring urging said ball so as to allow the fluid to pass from said intake port into said first chamber section.

12. A high-pressure generating device as claimed in claim 4, wherein said first check valve is a switching valve operated by the operating fluid fed from said operating pressure source so as to allow the fluid to pass from said intake port into said first chamber section.

13. A high-pressure generating device as claimed in claim 4, wherein said actuator includes a selection valve, a first pilot valve means with a push rod and a second pilot valve means with a push rod, said first and second pilot valve means being alternately operated in conjunction with said selection valve to move said piston reciprocally.

14. A high-pressure generating device as claimed in claim 4, wherein said actuator includes an operating pressure source for supplying operating fluid, a first hydraulic control chamber defined by said housing and said first baffle member of said piston for receiving said operating fluid from said operating pressure source to move said piston in a first direction, a second hydraulic control chamber defined by said housing and said second baffle member of said piston for receiving said operating fluid from said operating pressure source to move said piston in a second direction, and a directional control valve for selectively feeding said operating fluid from said operating pressure source to either said first hydraulic control chamber or said second hydraulic control chamber.

15. A high-pressure generating device comprising:

a cylindrical housing with an intake port, an outlet port, a pressure chamber, a first protrusion extending inside said pressure chamber and having a first fluid passage connecting said intake port to said pressure chamber, a second protrusion extending inside said pressure chamber and having a third fluid passage connecting said outlet port to said pressure chamber, said second protrusion being provided at its innermost end with a partition member,

a cylindrical piston disposed reciprocally in said pressure chamber and having a first chamber section, a second chamber section, a third chamber section, a partition wall for partitioning said first and second chamber sections and a first baffle member and a second baffle member, said partition wall having a second fluid passage, said first chamber section

being connected to said intake port through said second fluid passage, said third chamber section being connected to said outlet port through a fluid passage in said second protrusion, said first and second chamber sections being connected to each other through a second fluid passage in said partition wall,

a first check valve mounted in said first fluid passage for allowing fluid to flow from said intake port to said first chamber section,

a second check valve mounted in said second fluid passage for allowing fluid to flow from said first chamber section to said second chamber section,

a third check valve mounted in said third fluid passage for allowing fluid to flow from said second chamber section to said third chamber section,

an actuator including an operating pressure source for supplying operating fluid, a first hydraulic control chamber defined by said housing and said first baffle member of said piston for receiving said operating fluid from said operating pressure source to move said piston in a first direction, a second hydraulic control chamber defined by said housing and said second baffle member of said piston for receiving said operating fluid from said operating pressure source to move said piston in a second direction, and a directional control valve for selectively feeding said operating fluid from said operating pressure source to either said first hydraulic control chamber or said second hydraulic control chamber.

16. A high-pressure generating device as claimed in claim 4, wherein said first chamber section is larger in volume than said second chamber section.